

# ROBINSON POND MID SEASON UPDATE



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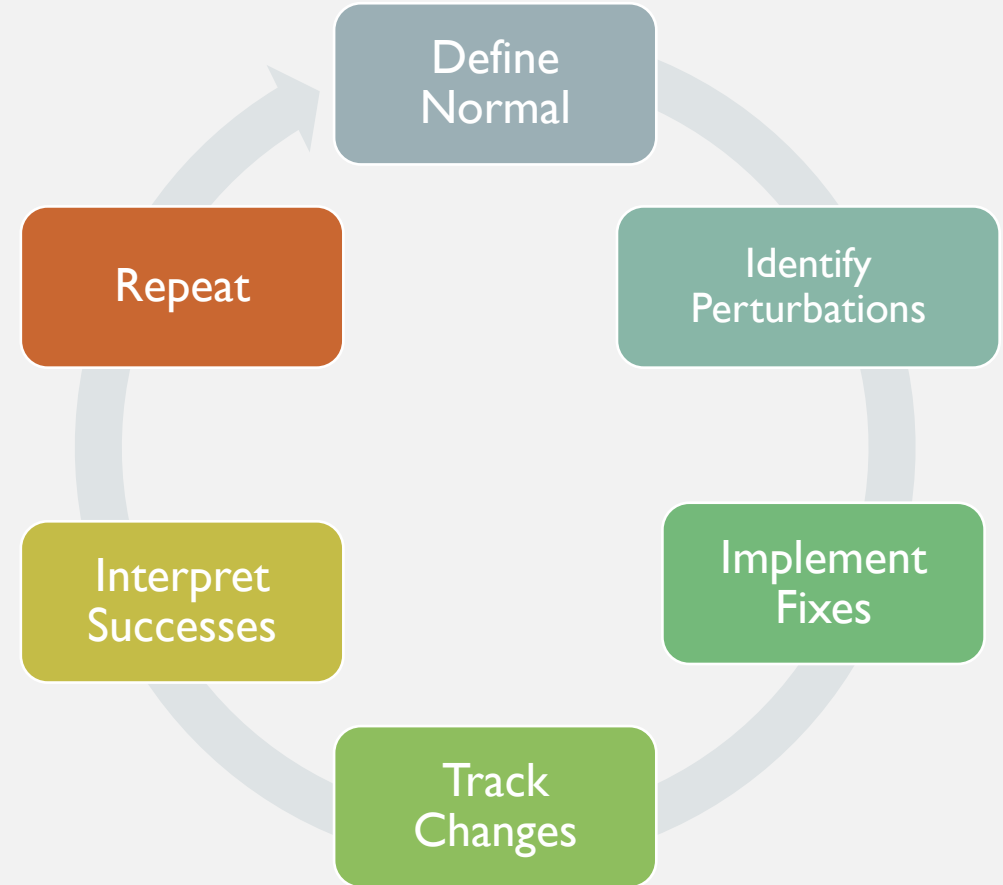
# OUTLINE

- Lake Ecology Primer
- Problem Plants and Recommendations
- Circulation Observations
- Watershed and the Roe-Jan
- 2021 Report components



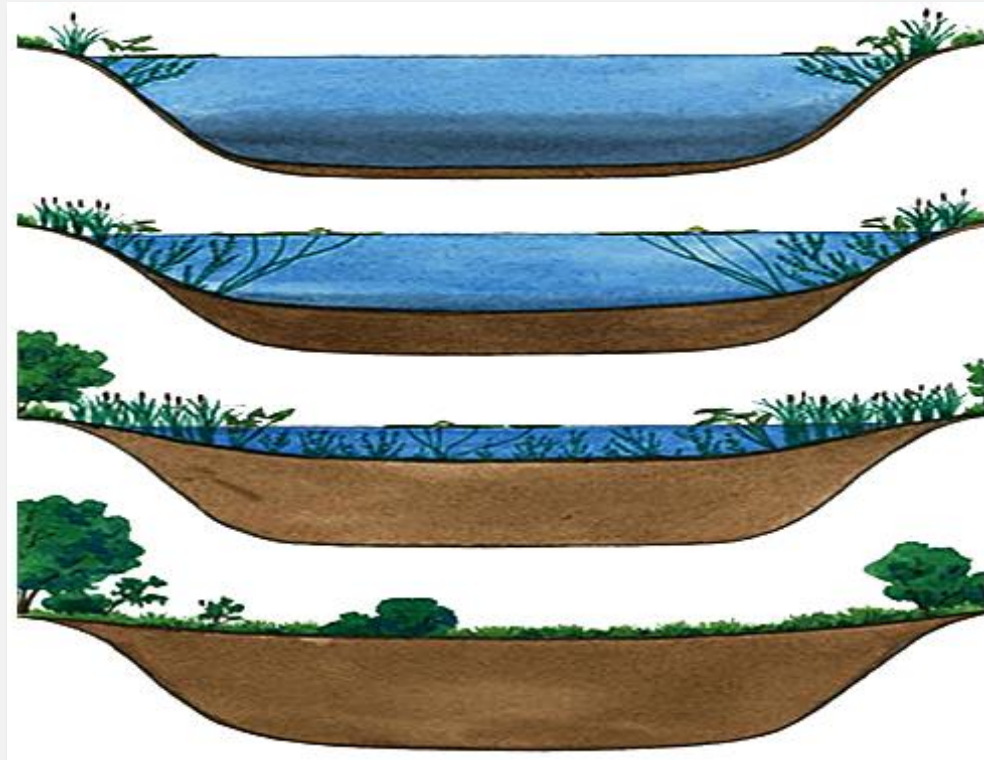
# LAKE SCIENCE (LIMNOLOGY) VS. LAKE MANAGEMENT

- Lakes are large complicated ecological systems, many variables
- Monitoring defines what is “normal”
- Lake management = manipulating nature to suit human uses
  - Requires scientific data, can get messy, expensive
  - As long as humans and lakes coexist, there will need to be ongoing management

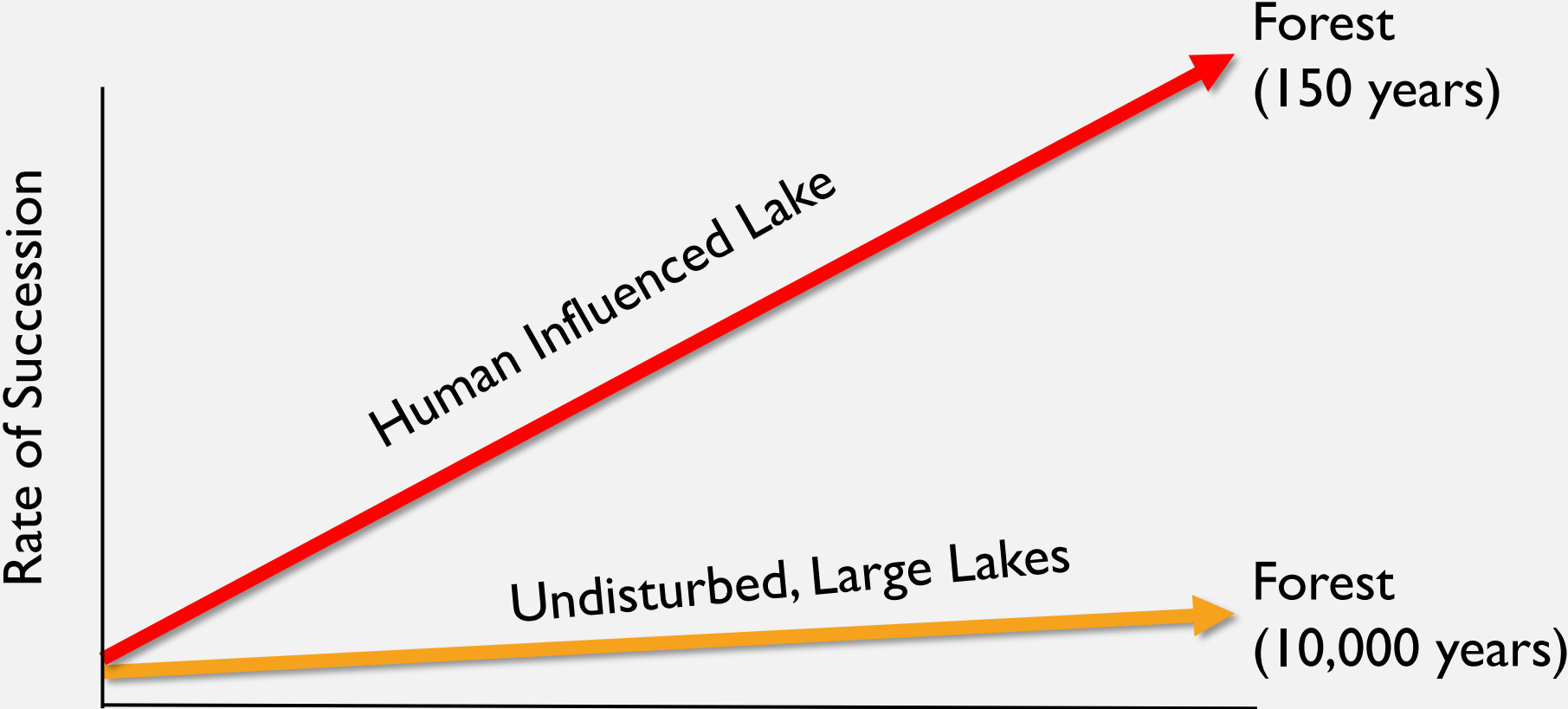


# LIMNOLOGY AND ONTOLOGY

- All lakes are on a trajectory of increasing production that began with the last glacier and will end with a forest



**Humans have inadvertently greatly accelerated the rate of “filling in”.**



**Think of this progression as a train ride**

You can stand in front of the train and wave you hands with Alum, aeration, herbicides, 9point plans, harvesting, dredging – what ever - **its not going to stop the train,** let alone make it reverse, however, it may, if done correctly, slow it down for a time.

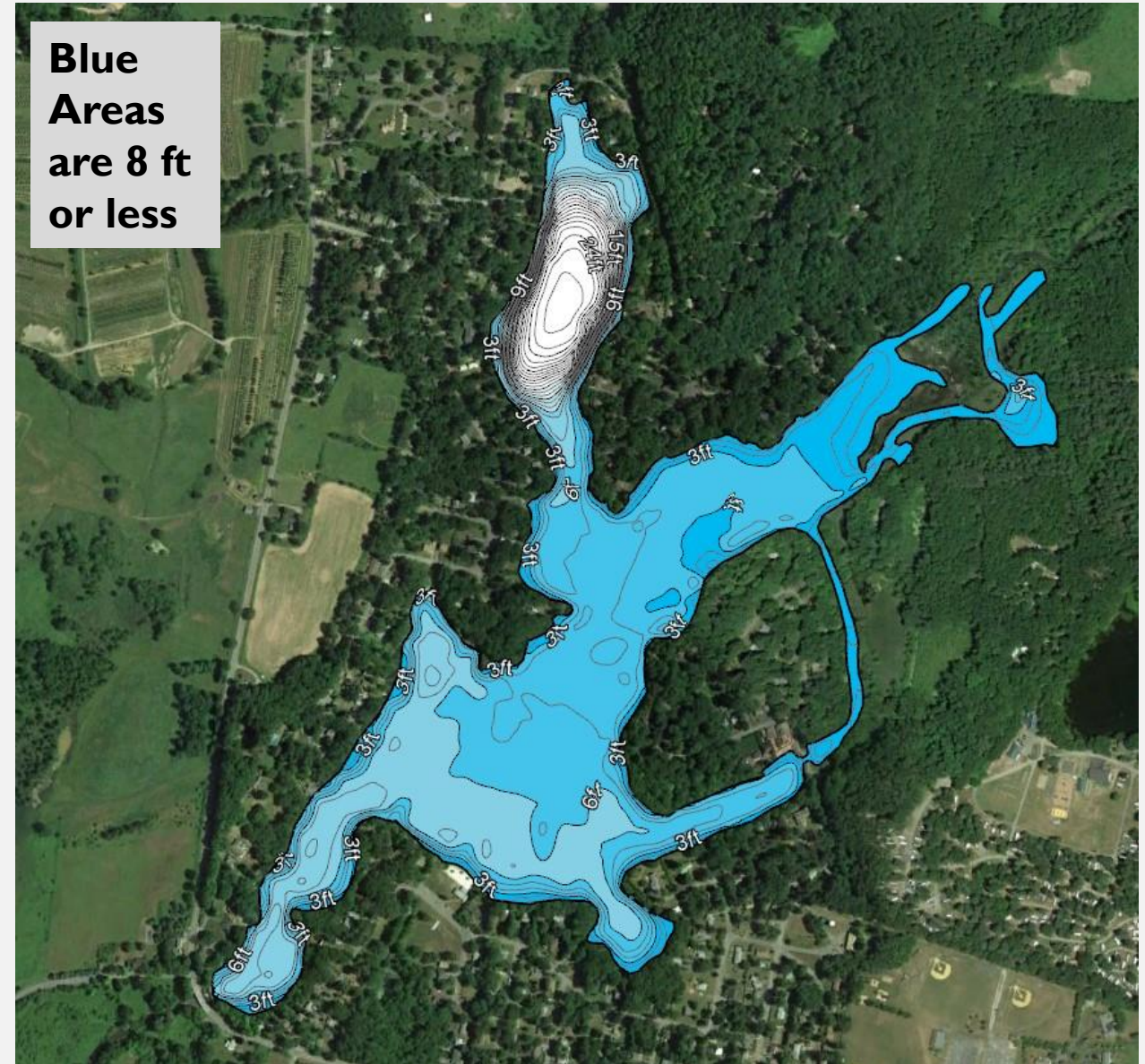


# WHAT WE TRY TO ACHIEVE WITH LAKE MANAGEMENT

- Slowing down the train is the long term goal
  - Limiting production in lakes via limiting the amount of phosphorus, nitrogen, sediments and organic material that enter and cycle in the system.
- As the train speeds up, the ride becomes increasingly uncomfortable for its patrons
  - Decreased lake depths, reduced clarity, increased incidence of harmful algae blooms, increased aquatic plant growth.
- **Needs to be a combination of short term remedies to keep desired uses in tact and long term management to slow the rate of succession.**

# ROBINSON POND

- 115 Acres
- Manmade reservoir
  - Dendritic shoreline
- Extremely shallow
  - Most of the lake is less than 8 feet.
- Bays are different in terms of local land use and depth.
- Low water retention time (high flow through).

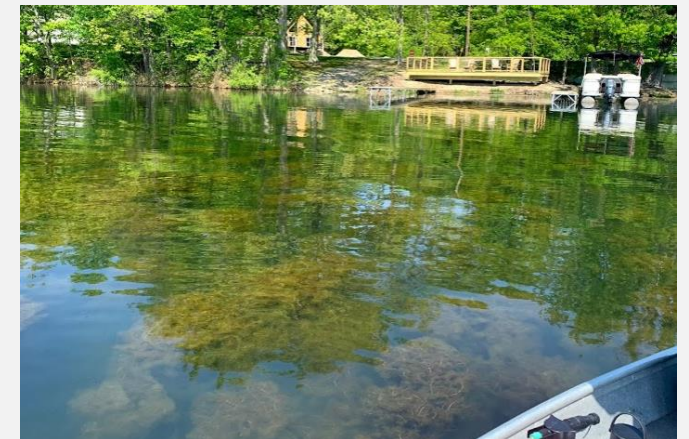




# PROBLEM PLANT: EURASIAN WATERMILFOIL



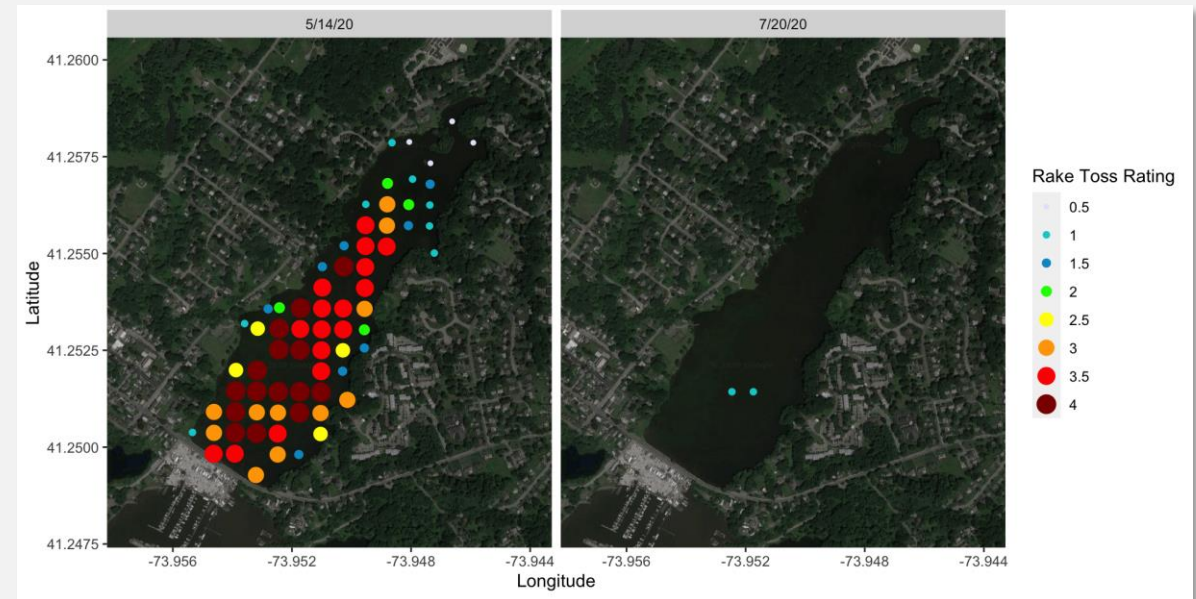
- One of the most ubiquitous invasive species in New York
- Adapted to shoot straight to the surface, and branch out horizontally
- Spreads via fragmentation, only need a few inches of stem to re-colonize.
- Distributed throughout the pond, with late season growth reaching the surface



# PLANT CONTROL OPTIONS

## EURASIAN WATERMILFOIL

- Integration of multiple strategies for best control
- Use harvester to continue to manage boating access.
  - Winter: examine harvesting practices/efficiency
- Use of EPA registered herbicides for lakewide control
  - Specific treatment areas to follow this winter
  - ProcellaCOR would be first recommendation.
    - ProcellaCOR has had an excellent track record for milfoil control



Excellent control 2 months after treatment with ProcellaCOR

# PROBLEM PLANT: DUCKWEED/WATERMEAL



- Native, but often a nuisance
- Watermeal is the smallest vascular plant in the world!
- Used as a remediation tool in wastewater
- Thrives in high nitrogen environments
- Very difficult to control



# PLANT CONTROL RECOMMENDATIONS

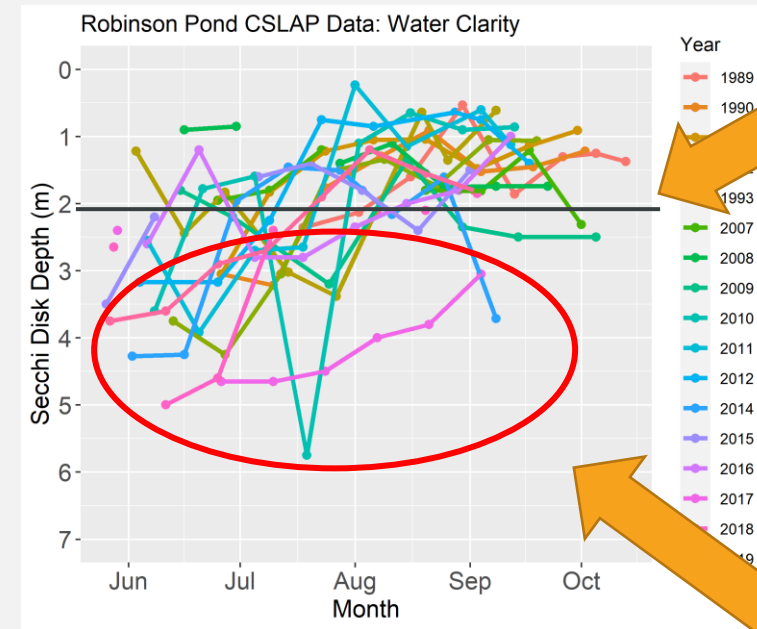
## DUCKWEED/WATERMEAL

- Evaluate effectiveness of skimmer
  - How much can it remove and for how long?
  - Drawbacks?
- EPA registered herbicides for short term control
  - Flumioxazin after milfoil treatment
  - Longevity of control unknown due to treatment complications
  - Long term control requires management of nutrients



# CONSIDERATIONS FOR PLANT CONTROL

- Understanding nature of Robinson Pond
  - Shallow, impacted lake
  - Plants will grow!
  - Diverse shoreline plays a role.
  - Need a balance, lakes with no plants can have other, more severe issues.
    - Clear vs turbid state



2 m Guidance Value  
NYSDEC



High plant coverage,  
excellent clarity



Plants eradicated, shift to  
algae-dominated system

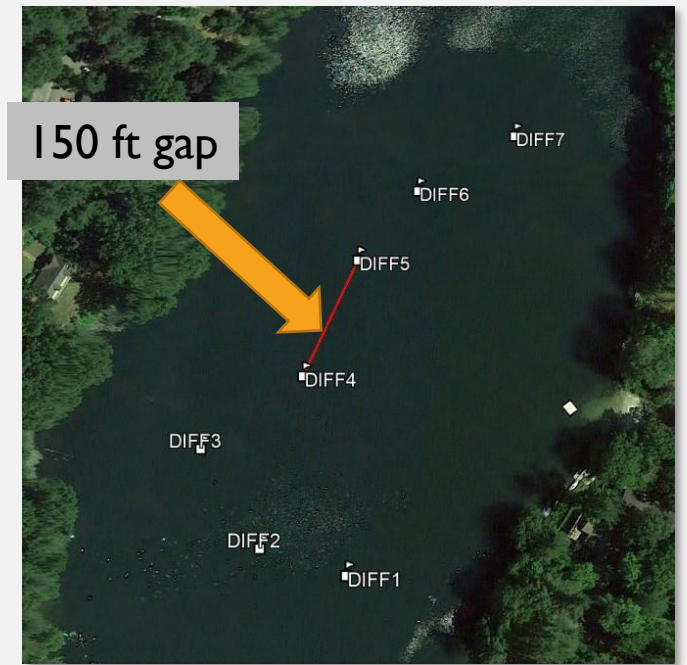
Excellent clarity on  
multiple occasions,  
related to plant  
coverage?

# CIRCULATION SYSTEM

- Circulation system in northern, deep arm.
- Purpose is unclear
- Does not effectively mix water column consistently throughout summer
  - Most likely due to diffuser spacing



Greater than 3 °C  
difference  
top to bottom



Temperature Profiles 2021					
Depth	4/27/21	5/26/21	6/29/21	7/20/21	8/31/2021
0	13.9	21.1	29.5	24.8	25.0
1	13.1	20.3	27.1	22.4	24.6
2	12.4	19.7	26.3	21.8	24.3
3	12	18.8	25.8	21.3	24.2
4	11.8	17.3	25.3	20.9	24.1
5	11.4	16	24.6	20.2	24.1
6	10.4	14.4	24.1	19.7	24.0
7	9.4	11.6	22.9	19.2	23.8
bottom	8.8	10.6	21.4	18.6	23.2

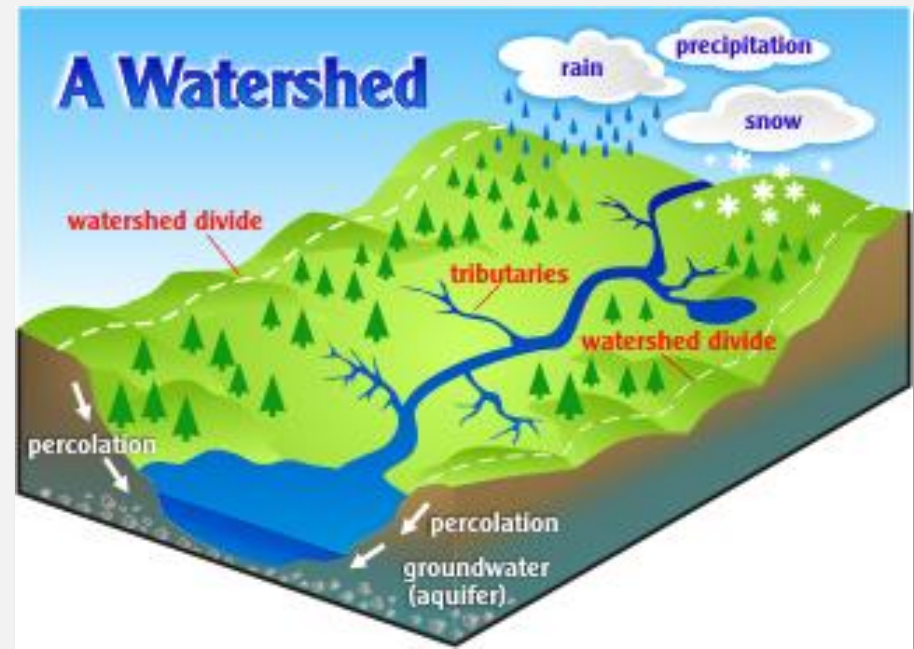
# LAKES REFLECT THEIR WATERSHEDS

- **Watershed:** All of the area that drains to a particular waterbody.
- Lakes get their water from the surrounding land.
- Land use greatly affects the quality of this water.
  - Forested watersheds usually have low export of nutrients
  - Urban and Agricultural watersheds have high export of nutrients

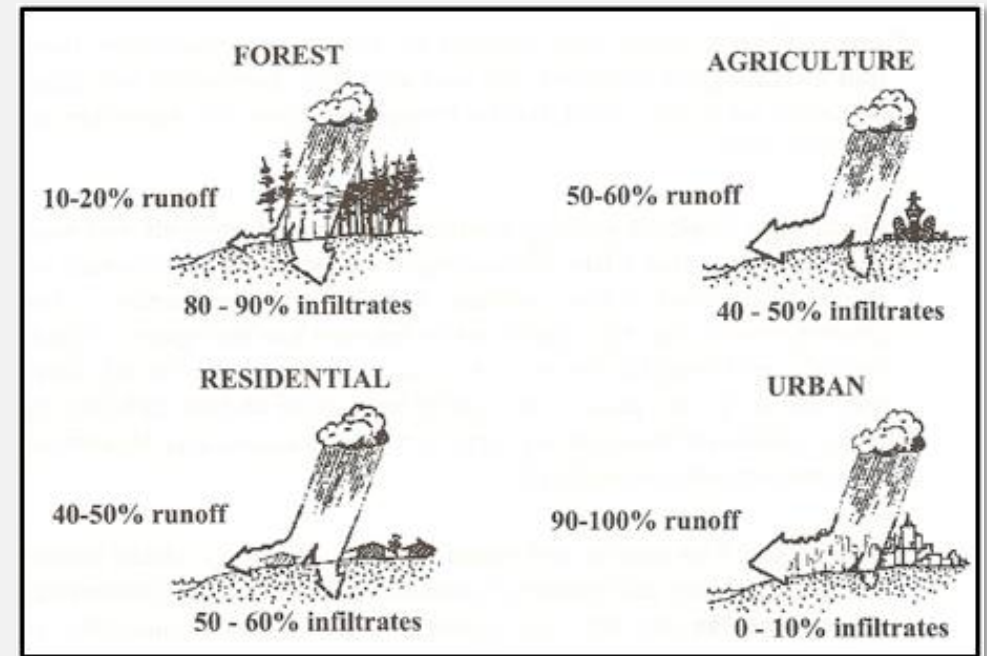
Increase in Watershed Development



Decrease in Quality Water Entering Lake



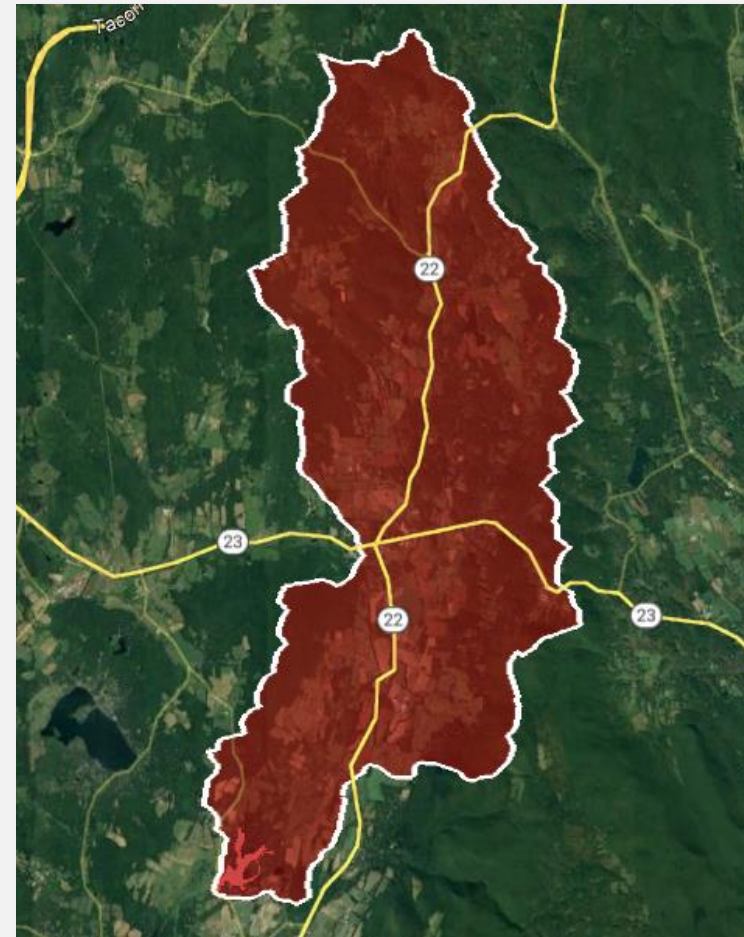
Source: <https://www.delcocc.org/watersheds/>



# ROBINSON POND WATERSHED

- Extremely large watershed relative to lake
  - It would take ~190 Robinson pond sized areas to fill the entire watershed!

Watershed Characteristics	
Watershed Size	21632 Acres
Lake to Watershed Size Ratio	<b>188:1</b>
% of Agriculture in Watershed	31
% of Forest in Watershed	56





# ROELIFF-JANSEN KILL

- Source stream for Robinson Pond.
- Accounts for over 95% of the total watershed draining to Robinson Pond.
- High Phosphorus and Nitrogen on multiple occasions.

Station	Sampling Date	TP (ug/l)	TN (ug/l)
Twin Bridges Road	4/27/21	22.1	<b>1117</b>
Twin Bridges Road	5/26/21	20.4	<b>1178</b>
Twin Bridges Road	6/29/21	47.3	<b>1618</b>

April 27<sup>th</sup>, 2021



July 20<sup>th</sup>, 2021



**Roeliff-Jansen Kill nutrient inputs need to be managed**

# 2021 REPORT COMPONENTS

- Compile and analyze all data collected during 2021 season
  - As of now, we only have early July nutrient data
- Examination of past and current management practices
- Short and long term water quality recommendations
  - Both in-lake and watershed
- Strategies for individual homeowner lake smart living
- Timeline of proposed activities and future monitoring
- Funding opportunities

QUESTIONS?